

CLAIMS

What is claimed is:

1. An apparatus for producing a scanned optical beam that scans through a substantially rectilinear pattern, comprising:

a first mirror mounted to scan periodically about a first axis at a first frequency, the first mirror being positioned to sweep the optical path about the first axis in a forward direction and a reverse direction;

a first light feed positioned in a first location and oriented to emit a first beam of light from a first location toward the first mirror, the first light feed being responsive to a first electrical signal to emit the first beam;

a second light feed positioned in a second location and oriented to emit a second beam of light from a second location toward the first mirror, the second light feed being responsive to a second electrical signal to emit the second beam; and

an electronic control circuit having a first output coupled to the first light feed and a second output coupled to the second light feed, the electronic control circuit being operative to provide the first electrical signal when the mirror sweeps in the forward direction and operative to provide the second electrical signal when the mirror sweeps in the second direction.

2. The apparatus of claim 1 further comprising:

a position detector coupled to the electronic control circuit and responsive to movement of the mirror to produce a sense signal indicative of whether the mirror is sweeping in the forward or reverse direction, wherein the electronic control circuit is responsive to the sense signal to provide the first electrical signal during forward sweeps and the second electrical signal during reverse sweeps.

3. The apparatus of claim 1 wherein the first feed is positioned and oriented such that the first beam of light scans over a first angular range and wherein the second feed is positioned and oriented such that the second beam of light scans over a second angular range that is substantially nonoverlapping with respect to the first angular range.

4. The apparatus of claim 1 further comprising a light emitter and an optical switch, the optical switch including a light input coupled to the light emitter, a first output, a second output, and an electrical input, wherein the optical switch is responsive to the first electrical signal to direct light from the optical input to the first output and is responsive to the second electrical signal to direct light from the optical input to the second output.

5. The apparatus of claim 1 further wherein the first light feed includes a first light emitter and the second light feed includes a second light emitter different from the first light emitter.

6. An apparatus for scanning light energy from or toward a target area, comprising:

a scanning mirror configured to scan continuously from a first angular extreme to a second angular extreme;

a first optical emitter or detector aligned to the scanning mirror and positioned to image or illuminate a first region of the target area when the scanning mirror is at the first angular extreme and to image or illuminate a second region of the target area different from the first region when the scanning mirror is at the second angular extreme; and

a second optical emitter or detector aligned to the scanning mirror and positioned to image or illuminate the second region of the target area when the scanning mirror is at the first angular extreme and to image or illuminate a third

region of the target area different from the first and second regions when the scanning mirror is at the second angular extreme.

7. The apparatus of claim 6 further comprising:

a second mirror positioned both in a first optical path between the first optical emitter or detector and the second region and in a second optical path between the second optical emitter or detector and the second region, the second mirror being mounted to pivot about an axis orthogonal to a pivot axis of the scanning mirror.

8. The apparatus of claim 6 wherein the scanning mirror is mounted to pivot along a sweep direction orthogonal to the first and second angular extremes, the scanning mirror being simultaneously movable along the sweep direction and between the angular extremes.

9. The apparatus of claim 6 wherein the scanning mirror is pivotable along two axes, further including a driving source coupled to the scanning mirror and operative to pivot the scanning mirror through a scan path that defines a substantially raster pattern of imaging or illuminating of the first detector or emitter.

10. A scanning display responsive to an image signal having signal portions representing lines of a display, comprising:

a first light source responsive to a first signal to emit light along a first optical path;

a second light source responsive to a second signal to emit light along a second optical path;

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a scanning assembly positioned to receive light from the first and second light sources and to redirect the receive light from the first light source along a first scan path toward a first image region and to redirect the received light from the second light source along a second scan path toward a second image region; and

an electronic controller having an input port for receiving the image signal, the electronic controller being operative to divide each signal portion into parts, each part representing a segment of the respective line and to produce the first signal in response to a first of the segments and to produce the second signal in response to a second of the segments.

11. The display of claim 10 wherein the scanner and light sources are positioned such that the first and second regions are substantially non-overlapping.

12. The display of claim 10 wherein each of the first and second light sources includes a plurality of light emitting devices, each light emitting device having a respective wavelength range.

13. The display of claim 12 wherein the wavelength range of each light emitting device in each plurality of light emitting devices is different from the wavelength range of the other light emitting devices in that plurality of light emitting devices.

14. The display of claim 10 wherein the first and second light sources share a common light emitting device.

15. The display of claim 14 further including an electronically controlled light guide having a first path extending between the common light emitting device and first light source and a second path extending between the common light emitting

device and second light source, the electronically controlled light guide being selectively switchable between the first and second paths.

16. A method of scanning a substantially raster pattern in a system having at least one resonant scanner having a forward scan direction and a reverse scan direction, comprising the steps of:

providing light to the resonant scanner from a first optical source when the resonant scanner is scanning in the forward scan direction; and

providing light to the resonant scanner from a second optical source different from the first optical source when the resonant scanner is scanning in the reverse scan direction.

17. The method of claim 16 further comprising the steps of:

directing light from the resonant scanner to a first viewing region when the resonant scanner is scanning in the forward scan direction; and

directing light from the resonant scanner to a second viewing region when the resonant scanner is scanning in the reverse scan direction.

18. The method of claim 17 wherein the first and second viewing regions are substantially nonoverlapping.

19. The method of claim 18 wherein the first and second viewing regions are immediately adjacent.

20. The method of claim 15 wherein the resonant scanner includes a scanning mirror that scans through a periodic pattern and wherein the step of providing light to the resonant scanner from a first optical source when the resonant scanner is scanning in the forward scan direction includes directing light from a first location to the scanning mirror along a first optical path and wherein the step of directing

light from the resonant scanner to a second viewing region when the resonant scanner is scanning in the reverse scan direction includes directing light from a second location to the scanning mirror along a second optical path that is not parallel to the first optical path.

21. The method of claim 15 further including:

modulating light from the first optical source according to a first portion of a desired image when the resonant scanner is scanning in the forward scan direction; and

modulating light from the second optical source according to a second portion of the desired image different from the first portion when the resonant scanner is scanning in the reverse scan direction.

22. The method of claim 21 wherein the first and second portions are substantially contiguous, adjacent portions of the desired image.

23. The method of claim 22 wherein the first and second portions are substantially nonoverlapping.

24. A method of scanning light through a selected target area, comprising the steps of:

scanning with a scanning assembly a first optical path through a first substantially raster pattern, the first substantially raster pattern including both forward and reverse sweeps;

while scanning the first optical path through the first substantially raster pattern, scanning with the scanning assembly a second optical path through a second substantially raster pattern, the second substantially raster pattern including both forward and reverse sweeps;

blocking the first optical path during reverse sweeps;

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transmitting light along the first optical path during forward sweeps;
blocking the second optical path during forward sweeps; and
transmitting light along the second optical path during reverse sweeps.

25. The method of claim 25 further including:
modulating the light according to first portions of respective image lines during the forward sweeps; and
modulating the light according to second portions of respective image lines during the reverse sweeps, wherein the first and second portions form the respective image lines.
26. The method of claim 25 wherein the scanning assembly includes a resonant scanning mirror further including:
defining the first optical path by aligning a first light emitter to the scanning mirror in a first orientation; and
defining the second optical path by aligning a second light emitter different from the first light emitter to the scanning mirror in a second orientation.

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